

**A-1 URBAN WATER CONSERVATION GRANT APPLICATION  
COVER SHEET**

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1. Applicant (Organization or affiliation): Regional Water Authority
2. Project Title: Large Landscape Irrigation System Incentive Program
3. Person authorized to sign and submit proposal:
- |                        |  |
|------------------------|--|
| <b>Name, Title</b>     | Edward Winkler, Executive Director                           |
| <b>Mailing address</b> | 5620 Birdcage Street, Suite 180,<br>Citrus Heights, CA 95610 |
| <b>Telephone</b>       | 916-967-7692   |
| <b>Fax</b>             | 916-967-7322   |
| <b>E-mail</b>          | ewinkler@rwah2o.org  |
4. Contact person (if different):
- |                        |  |
|------------------------|--|
| <b>Name, Title</b>     | Charlie Pike, Regional Water Efficiency Manager              |
| <b>Mailing address</b> | 5620 Birdcage Street, Suite 180,<br>Citrus Heights, CA 95610 |
| <b>Telephone</b>       | 916-967-7692   |
| <b>Fax</b>             | 916-967-7322   |
| <b>E-mail</b>          | cpike@rwah20.org   |
5. Funds requested (dollar amount) with 10% contingency: \$1,950,000
6. Applicant funds pledged (local cost share) (dollar amount): \$195,000
7. Total project costs (dollar amount): \$2,145,000
8. Estimated net water savings (acre-feet/year): 785
- |  |                |
|--|----------------|
| Estimated total amount of water to be saved (acre-feet)<br>over 20 years (project life): | <u>46,331</u>  |
| Benefit/cost ratio of project for applicant:   | <u>2.3</u>     |
| Estimated average \$/acre-feet of water to be saved:                                     | <u>\$46/AF</u> |
9. Project life (month/year to month/year): 10/03 – 12/06
10. State Assembly District where the project is to be conducted: 4, 5, 6 and 10
11. State Senate District where the project is to be conducted: 1, 4, 5 and 6
12. Congressional District(s) where the project is to be conducted: 3, 4, 5
13. County where the project is to be conducted: Sacramento, Placer and El Dorado
14. Do the actions in this application involve physical changes in land use, or potential future changes in land use?
- (a) Yes
- (b) No No

## A-2 APPLICATION SIGNATURE PAGE

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By signing below, the official declares the following:

The truthfulness of all representations in the application;

The individual signing the form is authorized to submit the application on behalf of the applicant;

The individual signing the form read and understood the conflict of interest and confidentiality section and waives any and all rights to privacy and confidentiality of the application on behalf of the applicant; and

The applicant will comply with all terms and conditions identified in this Application Package if selected for funding.



Signature

Edward D. Winkler, Executive Director

Name and Title

12/01/02

Date

### **A-3 APPLICATION CHECKLIST**

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Complete this checklist to confirm all sections of this application package have been completed.

#### **Part A: Project Description, Organizational, Financial and Legal Information**

- ☒ A-1 Urban Water Conservation Grant Application Cover Sheet
- ☒ A-2 Application Signature Page
- ☒ A-3 Application Checklist
- ☒ A-4 Description of Project
- ☒ A-5 Maps
- ☒ A-6 Statement of work, schedule
- ☒ A-7 Monitoring and evaluation
- ☒ A-8 Qualification of applicant and cooperators
- ☒ A-9 Innovation
- ☒ A-10 Agency authority
- ☐ A-11 Operation and maintenance (O&M)

#### **Part B: Engineering and Hydrologic Feasibility (construction projects only)**

- ☒ B-1 Certification statement
- ☒ B-2 Project reports and previous studies
- ☐ B-3 Preliminary project plans and specifications
- ☒ B-4 Construction inspection plan

#### **Part C: Plan for Environmental Documentation and Permitting**

- ☐ C-1 CEQA/NEPA
- ☐ C-2 Permits, easements, licenses, acquisitions, and certifications
- ☐ C-3 Local land use plans
- ☐ C-4 Applicable legal requirements

#### **Part D: Need for Project and Community Involvement**

- ☒ D-1 Need for project
- ☒ D-2 Outreach, community involvement, support, opposition

#### **Part E: Water Use Efficiency Improvements and Other Benefits**

- ☒ E-1 Water use efficiency improvements
- ☒ E-2 Other project benefits

#### **Part F: Economic Justification, Benefits to Costs Analysis**

- ☒ F-1 Net water savings
- ☒ F-2 Project budget and budget justification
- ☒ F-3 Economic efficiency

**Appendix A: Summary List of Large Landscape Sites & Example Completed Report of Landscape Audit**

**Appendix B: Project Managers Resumes**

**Appendix C: External Cooperator Commitment Letters**

**Appendix D: Background Information for Data Assumptions**

**Appendix E: Letter of Support – Sacramento Water Forum**

**Appendix F: Example Outreach Materials**

**Appendix G: Economic Uncertainty Analysis Results**

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## A-4 DESCRIPTION OF PROJECT

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The project consists of providing financial incentive to retrofits irrigation systems at large landscape sites located within the metropolitan region of Sacramento, California. Eligible sites for the incentives are landscape accounts that have had site audits with a water budget developed. A summary list of some medium and large landscape sites eligible for these funds is provided in Appendix A. Note this project will build on landscape audits and water budgets currently being completed under an already funded grant by the United States Bureau of Reclamation (USBR). This project will be regionally administered through the Regional Water Authority (RWA) in Sacramento, California to enable 300 site owners to receive direct financial assistance in the form of a two-part incentive to purchase irrigation system equipment. Eleven (11) retail agencies will participate in this program as external cooperators.

External cooperating water agencies for this project are:

Citrus Heights Water District  
City of Folsom  
City of Lincoln  
City of Roseville  
City of Sacramento  
County of Sacramento  
El Dorado Irrigation District  
Fair Oaks Water District  
Placer County Water Agency  
Sacramento Suburban Water District  
San Juan Water District

The efficient use of California's limited water supplies is a critical local, regional, and statewide water issue. RWA assists 18 member water suppliers serving more 756,000 acre-feet of water per year to more than 1.2 million people. These retail water suppliers utilize both surface water from the Sacramento River and American River and groundwater as part of their water supply. Figure 1 depicts the location of service area of RWA member agencies.

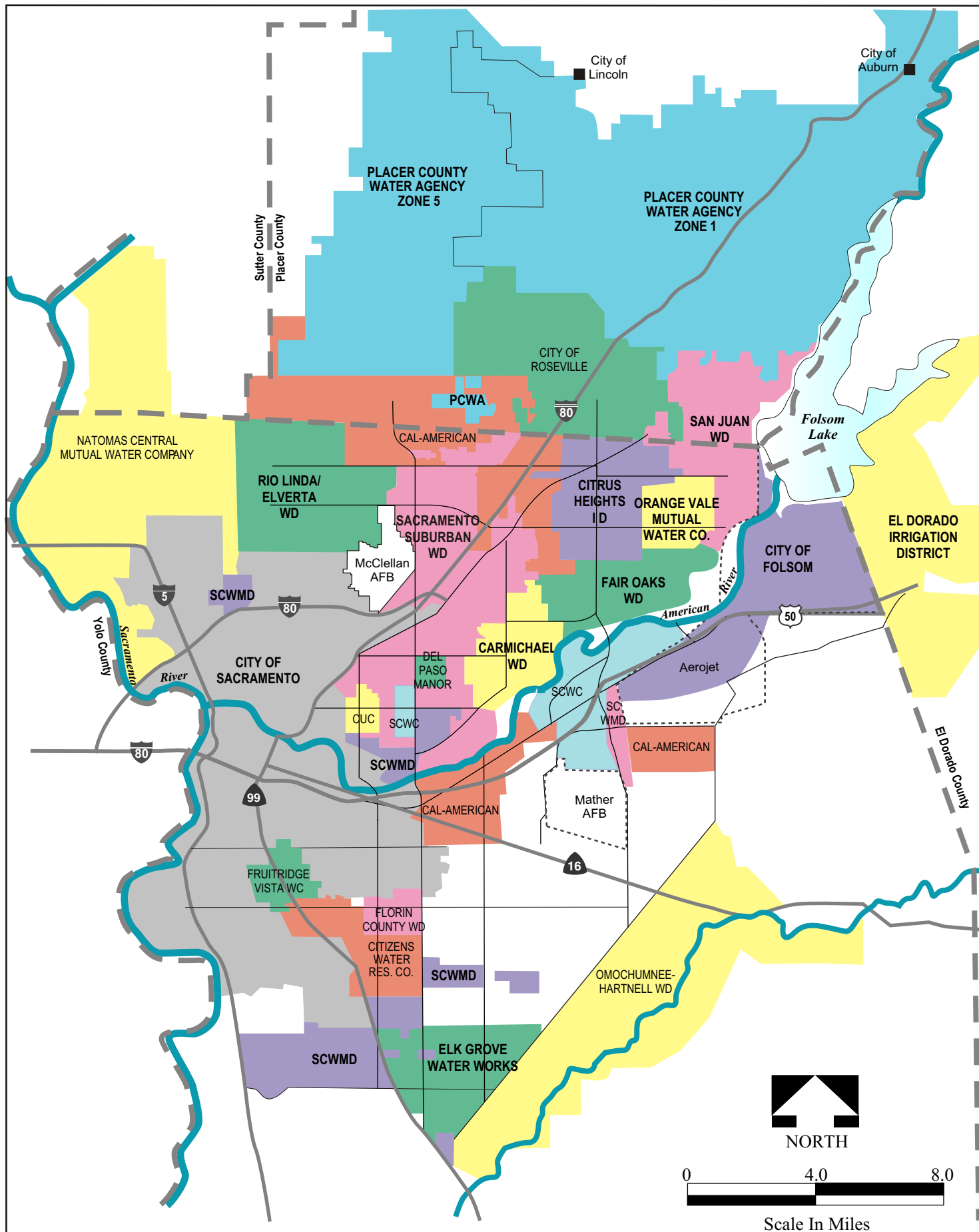
The project cost is \$2,145,000 including local agencies' matching contribution. The total proposed grant amount is \$1,950,000 with 10% contingency included. This project can be considered scalable but not separable as described in Section A.6.3 of the application. It is expected that twenty-five (25) percent of the on-site consumptive water use during the summer peak irrigation period will be conserved through the physical improvement of **three hundred (300) irrigation systems**. It is assumed that the irrigable area for these systems average 4.75 acres and have an average consumptive water use of 6.6 acre-ft/acre per 6-month summer period (April through October). This project will result in total annual average water savings of **785 ac-ft/year**, or **46,331 ac-ft** over a 20-year period.

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## A-5 MAP

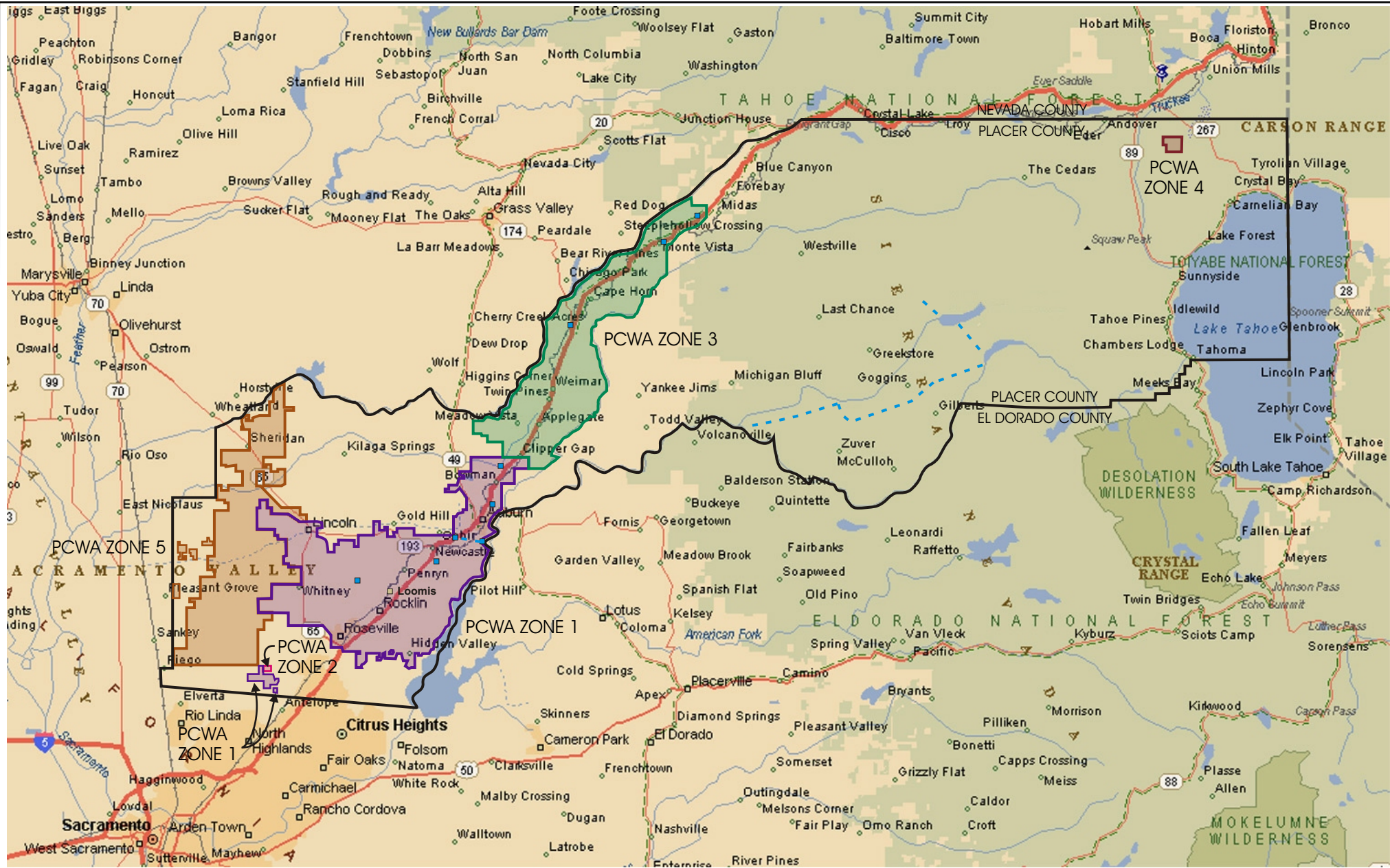
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Figure 1 depicts the location of water sources of supply and service areas of RWA member agencies. Figure 2 and 3 present the service area boundaries for Placer County Water Agency and El Dorado Irrigation District, respectively. Figure 4 illustrates the USGS topographical vicinity map for the regional area.



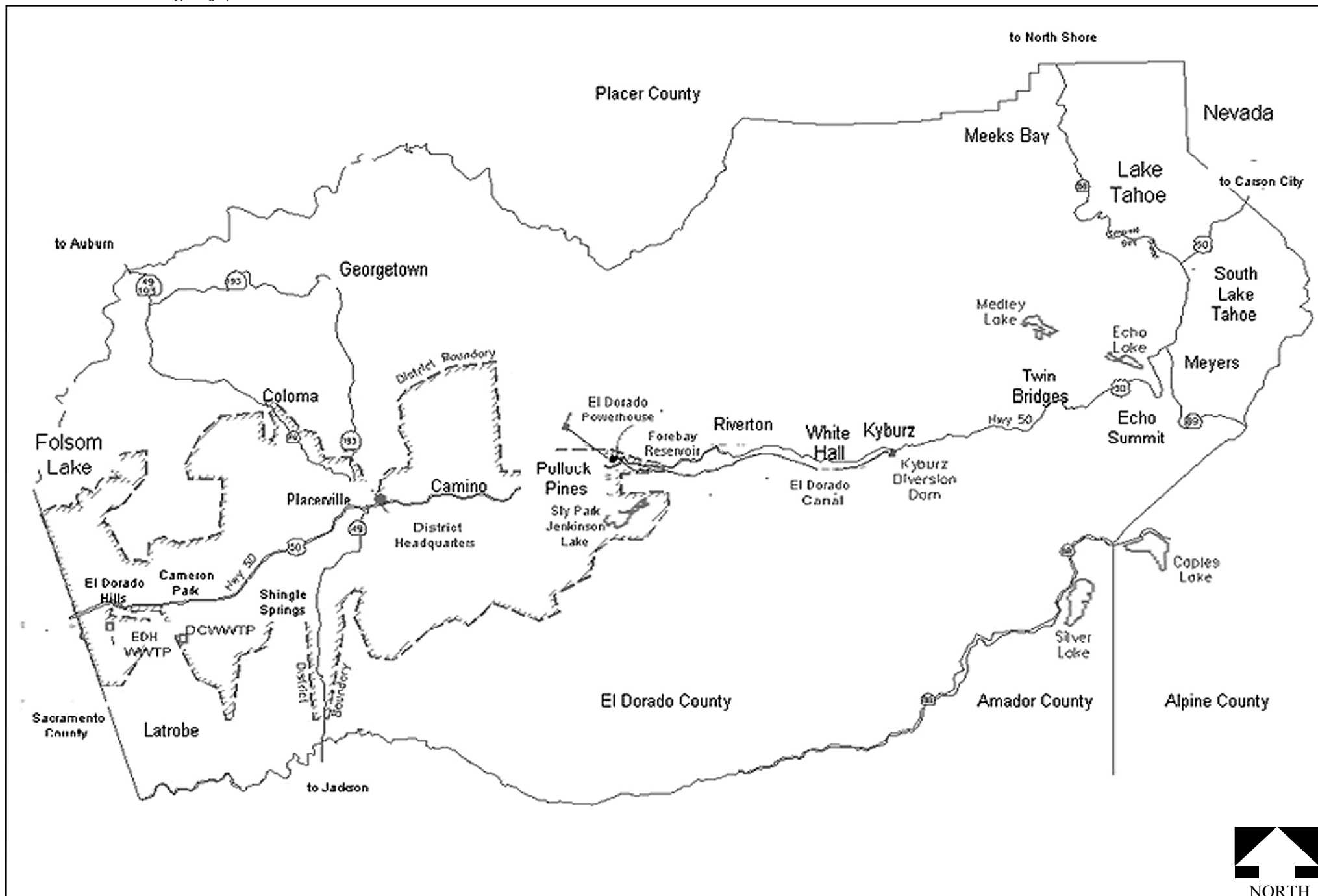
DATE	12-2-02	PROJECT	23546	SITE	DWR WUE Grant Application	FIGURE
B R O W N     A N D		C A L D W E L L		TITLE		
Sacramento Regional Area Water Suppliers					1	





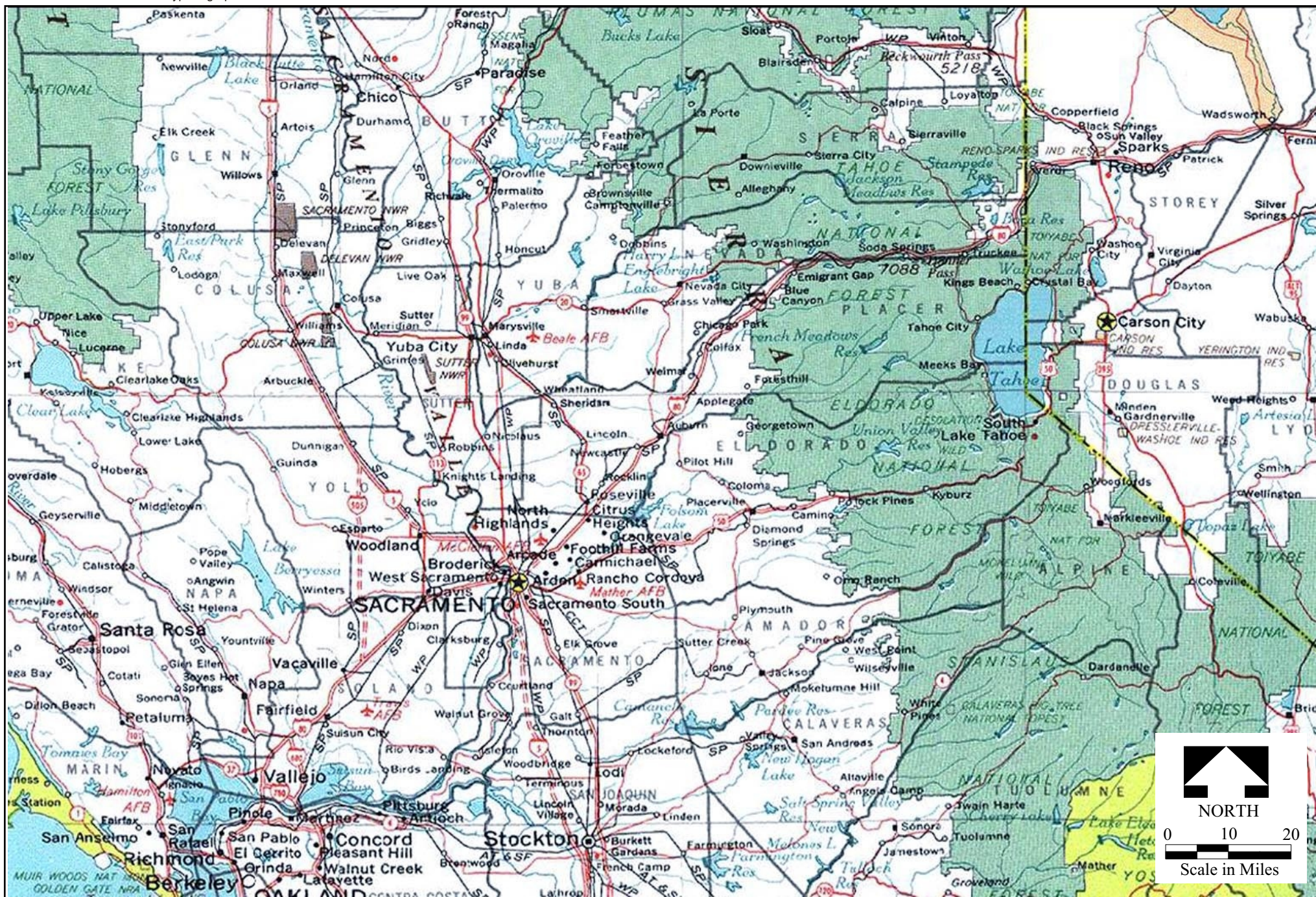
Source: Microsoft Trip Planner 98

B R O W N   A N D C A L D W E L L	DATE	12-2-02	DWR WUE Grant Application  Placer County Water Agency Service Area Map	NORTH FIGURE  2
	PROJECT	23546		



B R O W N   A N D C A L D W E L L	DATE	12-2-02	DWR WUE Grant Application	FIGURE  3
	PROJECT	23546	El Dorado Irrigation District Service Area Map	





BROWN AND  
CALDWELL

DATE  
12-2-02  
PROJECT  
23546

TITLE

DWR WUE Grant Application  
USGS Topographical Map for Vicinity of Sources of Supply  
and Service Areas of Sacramento Regional Participating Agencies

FIGURE

4



## **A-6 STATEMENT OF WORK, SCHEDULE**

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This section describes the nature, scope, and objectives of the project. It also includes a statement of critical local, regional, Bay-Delta, State and federal water issues and a description of how this project is consistent with local and regional water management plans and other resource management plans.

### **A.6.1 Nature, Scope, and Objectives of the Project**

The overall goal of this project is the reduction of peak summer consumptive water use for irrigating large landscaped areas in the Sacramento region. Currently, most of the retail water agencies within the Sacramento area are undergoing the conversion to water meters including dedicated irrigation meters. The conversion of these newly metered customers to a water billing rate structure based on their individual metered use from a flat-rate structure is causing these customers to take note of their water use, particularly higher summer water use for outdoor irrigation. While there is some relative cost savings to the customer from water savings on their water bill, the upgrade of an irrigation system is a capital-intensive project for the customer. It has been shown in other service areas in northern California, such as East Bay Municipal Utility District (EBMUD), that with assistance through an incentive from the water utility customers are sufficiently motivated to upgrade their irrigation system equipment.

The objective of this project is to provide incentive funding to the owners of sites that qualify for replacement of their irrigation system. Many sites have been audited under the pre-existing large landscape audit program currently underway and due for completion in December 2002. Site audit programs funded in part by under a USBR funded grant and funded in part by local agencies, have no provisions for funding financial incentives to site owners, which is the sole objective of this project. Thus, goal of this project is to build on information gained during the site audits. With the incentive provided by water utilities, site owners can implement the recommended upgrades for their irrigation systems uncovered in the site audits. RWA will administer rebates to 300 sites over a three-year time frame.

The rebate program will be regionally administered through RWA providing all administrative duties associated with the grant from DWR and the retail agencies covering the administrative costs of providing the rebate to the customer. Either in-house agency staff or a designated representative will conduct this project. This project will not include contracting out the regional administration of the grant, unless retail agencies specifically request the additional assistance in lieu of receiving administrative funding.

### **A.6.2 Scope of Work: Technical/Scientific Merit, Feasibility, Monitoring and Assessment**

This section describes the methods, procedures and facilities associated with the project. A task list and schedule and quarterly expenditure of the project are also included in this section.

#### **Methods, Procedures, and Facilities**

This project is a regional approach to provide financial incentive towards the purchase and installation of efficient irrigation systems. The costs of the project primarily involve the agency

match share and RWA administrative costs to implement the three year program. Approximately 300 rebates will be issued over the three-year period between January 2004 and December 2006.

The scope of this project consists of ten primary steps to be performed by RWA in conjunction with the member agency staff:

1. Continue to perform landscape audits.
2. Identify potential candidate sites and prioritize sites for potential incentives.
3. Contact site owner
4. Review submission and inspect site for incentive funding.
5. Approve payment and notify customer of incentive amount and procedures for collection.
6. Inspect site to ensure project installation.
7. Final approval for 50% payment of incentive for equipment installation.
8. Review irrigation account data prior to and post equipment installation.
9. Verify water savings based on irrigation account metered data for the following 6-month irrigation season (either 2004, 2005 or 2006) after inspection and initial award approved.
10. Approve remaining 50% payment of incentive to customer, assuming water savings meet program requirements.

RWA will use standard administrative procedures to implement this regional incentive program. Although not explicitly called for in this project, work will be performed by in-house agency staff, or Irrigation Association ([www.irrigation.org](http://www.irrigation.org)) accredited Landscape Auditor as a hired contractor. Due to the heterogeneity and liability with utility purchasing and installing irrigation system equipment on customer's facilities, it is foreseen that the most economical and feasible means for implementation of irrigation system upgrades is through an incentive program. Thus, since agencies do not require their standard purchasing and contracting procedures to purchase any items or installation of any systems. This project also does not require the purchase of land or easements, design, engineering, or encroachment permits.

For this project, RWA will have a formal written agreement with the participating utilities. RWA will have one designated project manager and each member agency will assign one designated contact for the administration of the landscape project within their service area. RWA project manager is responsible for the overall conduct of the project.

RWA project manager will be responsible for ensuring that each member agency fulfills its commitment to audit the large landscape site and implement the rebate to qualified sites under the stipulations of RWA directed regional irrigation rebate project guidelines. The retail water agency staff will, or alternatively RWA staff may elect to, inspect rebate recipients to ensure irrigation systems are upgraded as indicated in the application.

### **A.6.3 Task List and Schedule**

The tasks for implementation of this project and the project schedule are described below and presented on Figure 5. The schedule includes deliverable items and projected due dates for each task. The schedule bar chart also identifies which tasks are considered to be inseparable if only a portion of the project is funded. The project may be considered scalable to the minimum number of fifty-five (55) customer incentives (for 5 rebates per 11 participating agencies) before it's considered too administratively costly for implementation. RWA would be willing to commitment

to a maximum of 300 customer incentives or an increase in the maximum dollar amounts above the \$5,000. Table A-1 presents a quarterly expenditure projection.

### Tasks

1. Develop action plan per agency of a short-list of priority sites to target based on site audit information. Site audits are not considered a part of this project but are a necessary prerequisite to the work to be performed under this project.
2. Contact site owners and discuss possibilities for efficient irrigation system equipment purchase and installation according to recommendations from the site audits.
3. Initiate Phase I: review applications and irrigation system design plans, approve application, inspect installation of equipment, initiate first 50% of the reimbursement payments upon receipt of documentation from customer, review data for pre-installation and 12 month post installation to verify savings, approve remaining reimbursement.
4. Prepare Summary Progress Reports with each DWR invoice.
5. Review annual targets, if necessary revise goals for Phase II, and adapt marketing strategy.
6. Initiate Phase II: revise project goals of incentives if necessary based on outcomes of Interim Progress Report, otherwise proceed with project as outlined in Task 3 (review applications and irrigation system design plans, approve application, inspect installation of equipment, initiate remaining 50% of the reimbursement payments upon receipt of documentation from customer, review data for pre-installation and 12 month post installation to verify savings, approve remaining reimbursement).
7. Prepare Summary Progress Reports with each DWR quarterly invoice.
8. Review progress to date, if necessary revise goals for Phase III, and adapt marketing strategy.
9. Initiate Phase III: revise project goals of incentives if necessary based on outcomes of Interim Progress Report, otherwise proceed with project as outlined in Task 3 (review applications and irrigation system design plans, approve application, inspect installation of equipment, initiate remaining 50% of the reimbursement payments upon receipt of documentation from customer, review data for pre-installation and 12 month post installation to verify savings, approve remaining reimbursement).
10. Prepare Summary Progress Reports with each DWR quarterly invoice.
11. Prepare Monitoring and Evaluation Report. This report will be written following the end of the project for submission to DWR regarding the total project outcomes. It will include results of the irrigation system audits, incentives awarded, a summary the implementation, and the resulting water use and water savings.



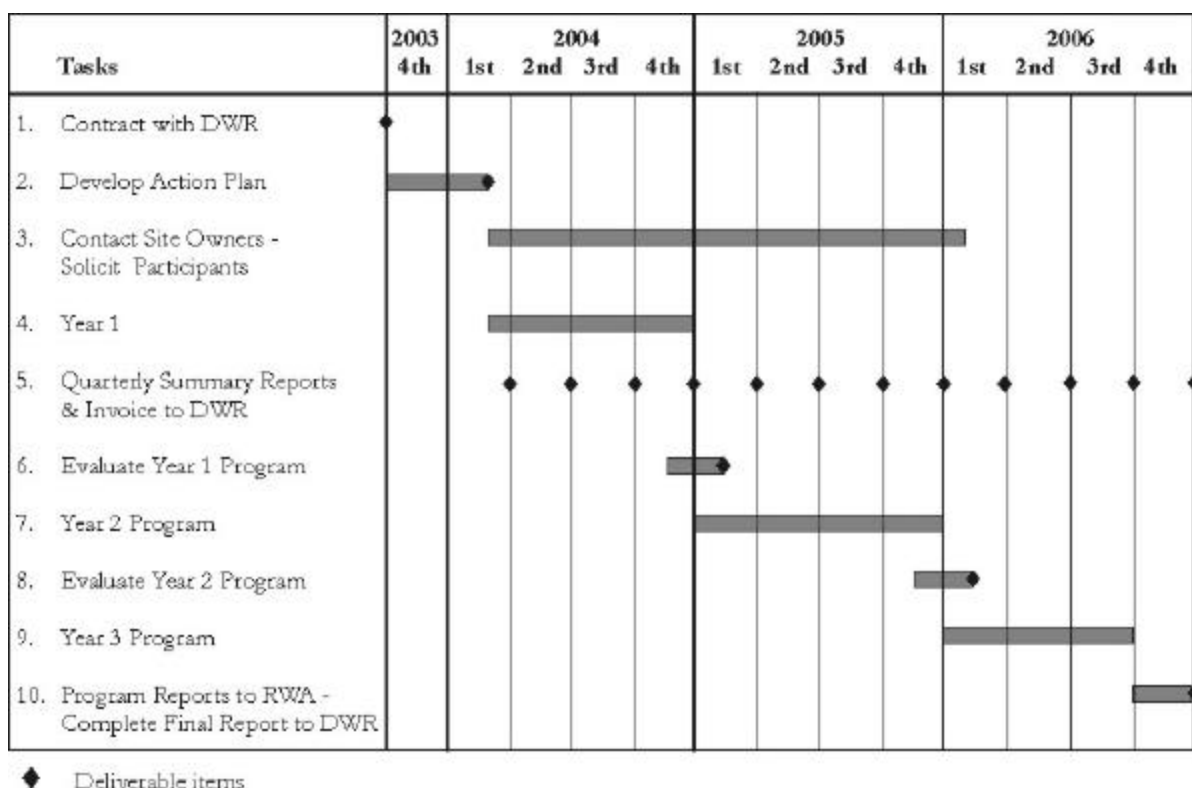


Figure 5. Project Timeline

Table A-1. Quarterly Expenditure Projection for DWR Matching Funds\*

Quarter	Months	Activity	Expenditure
<u>2003</u>			
4	October-December	RWA-DWR Contract Administration	\$30,000
<u>2004</u>			
1	January-March	Initiate Phase 1 RWA management Agreement with water suppliers; implementation, marketing, site selection begins	\$45,000
2	April-June	Application Processing, site inspection, customer system improvement	\$163,000
3	July-September	Initial 100 rebates begin, some at 50% of approved customer costs, Customers operate improved irrigation systems	\$153,000
4	October-December	Application review, selection, site inspection, customer improvements and initial 50% rebates continue; Review metered data of customers with early improvements and make second 50% payment. Phase 1 ends	\$278,000
<u>2005</u>			
1	January-March	Phase 2 begins Marketing & administration adjustments made. Application review, selection, site inspection, customer improvements and second set of 50% rebates continue for 33% annual participants.	\$112,000
2	April-June	Application review, selection, site inspection, customer improvements and second set of 50% initial rebates continue for 33% annual participants.	\$112,000

Quarter	Months	Activity	Expenditure
3	July-September	Application review, selection, site inspection, customer improvements and 50% initial rebate payments continue for 34% annual participants; customers operate improved irrigation systems	\$112,000
4	October-December	Application review, selection, site inspection, customer improvements continue; metered data review; last installments of 50% follow-payments made. Phase 2 ends	\$278,000
<u>2006</u>			
1	January-March	Phase 3 begins Marketing & administration adjustments made. Application review, selection, site inspection, customer improvements and second set of 50% rebates continue for 33% annual participants.	\$112,000
2	April-June	Application review, selection, site inspection, customer improvements and second set of 50% initial rebates continue for 33% annual participants.	\$112,000
3	July-September	Application review, selection, site inspection, customer improvements and 50% initial rebate payments continue for 34% annual participants; customers operate improved irrigation systems	\$112,000
4	October – December	Application review, selection, site inspection, customer improvements continue; metered data review; last installments of 50% follow-payments made. Phase 2 ends. Resolve outstanding payments. Monitoring and Evaluation Report begins. Resolve outstanding payments. Final report to DWR.	\$331,000
Total			\$1,950,000

\*Note: Costs within table do not include contingency.

## A-7 MONITORING AND EVALUATION

A list of project-specific performance measures that will be used to assess project success in relation to its goals is as follows:

The key performance measure is the actual water savings that are realized as a result of this project. Participating water suppliers will provide irrigation season water use data for participating customers. The data will be compared with usage data prior to irrigation system improvements and also compared to CIMIS ET data for the monitored months. RWA will determine the effectiveness of the program by the change of water use.

- Quarterly Summary Progress Reports will be prepared by each member agency. The reports will be a status report summarizing preliminary incentives awarded and a summary of installations and inspections conducted to date. These reports will be used to document the progress of the project and determine if the project is on schedule and aid in project control. These progress reports will be prepared and submitted along with quarterly invoice reimbursement requests.
- Annual Program Evaluations will occur with input from each member agency for at the conclusion of Year 1 and Year 2 of the program to allow for adjustments for the following year(s).

- A Monitoring and Assessment Report will be prepared by RWA following project completion during 4<sup>th</sup> quarter 2006. This report will summarize the monitoring and assessment of the before and after water use for the individual landscape sites account data pre and post project installation.

The Quarterly Summary Reports as submitted by RWA to DWR and the Monitoring and Assessment Report will be made available to the public at the RWA office. The information will be made available to the public through various outreach methods.

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## A-8 QUALIFICATIONS OF THE APPLICANT AND COOPERATORS

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The qualifications of the project manager, cooperators, and partners to be involved in the financial incentive program for RWA are discussed in this section.

**A.8.1 Resumes.** The project manager primarily responsible for irrigation system incentive program will be Charlie Pike, the Regional Water Efficiency Manager. Mr. Pike's resume is included in Appendix B. Mr. Pike has 19 years of experience associated with administration of incentive programs. Mr. Tim Crowley, Water Management Coordinator, City of Folsom will be assisting Mr. Pike, along with other water conservation coordinators for all external cooperating agencies. Mr. Crowley's resume is also included Appendix B.

**A.8.2 External Cooperators.** Letters of commitment are provided in Appendix C.

External cooperating water agencies for this project are:

Citrus Heights Water District  
 City of Folsom  
 City of Lincoln  
 City of Roseville  
 City of Sacramento  
 County of Sacramento  
 El Dorado Irrigation District  
 Fair Oaks Water District  
 Placer County Water Agency  
 Sacramento Suburban Water District  
 San Juan Water District

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## A-9 INNOVATION

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Many of the landscapes in the Sacramento area have been in existence for ten or more years. These irrigation systems are currently managed using older technologies that reflect older attitudes such as over generous applications of irrigation water. This project aims to revolutionize these outmoded attitudes.

Success by RWA principally comes in two distinctive forms: innovative technology and marketing, as follows.



1. These landscapes can be retrofitted with more recent technologies and implementation approaches. These measures improve irrigation hardware efficiency and make it easier for manager to improve irrigation management efficiency. Some of the innovations which can be used by the large landscape incentives project are:
  - Sprinklers with check valves so that water stays in the irrigation system when shut off
  - Pressure compensating emitters
  - Low pressure systems for non-turf landscapes
  - Spray nozzles that provide appropriate water droplet size to minimize drift and airborne evaporation.
  - Rain switches to interrupt controllers during and following rain events
  - Flow sensors and valves that stop flow due to broken risers and sprinklers
  - Irrigation controllers with 4 or more program and multiple start times.
2. Innovation continues beyond the specific hardware. Innovation includes marketing the use of tools, methods or materials in innovative ways. The regional landscape programs will bring improvements observed at different sites to other landscape customers. Visiting from site to site, the auditors can share information, insights, and adopt applications for innovative improvements with another customer. The results of an innovation by one customer can be multiplied through implementation at many sites.

RWA adoption of successful landscape incentive programs from EBMUD and Santa Clara Valley Water District (SCVWD) are an innovation to the Sacramento region. An example marketing brochure from SCVWD program outlines the innovative aspects of their Irrigation Technical Assistance Program that RWA is looking to emulate in its own program is provided in Appendix F.

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## **A-10 AGENCY AUTHORITY**

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### **Authority to Submit an Application and Enter Into a Funding Contract with the State**

1. At their regular meeting on October 23, 2002, the Regional Water Authority Executive Committee authorized the Executive Director to enter into a contract to prepare applications for 2003 Proposition 13 Urban Water Conservation Grant Funds due on December 3, 2002. The Executive Director is authorized to sign the applications and submit application materials to for qualifying water suppliers. Each of the water suppliers participating in the grant applications have entered into an agreement with RWA to fund the applications and participate in the projects should they be funded. Should the application be funded, the Regional Water Authority will consider a separate resolution to enter into an agreement with the State to accept grant funds and implement the proposed project. The RWA has existing funding contracts with the State.
2. The Regional Water Authority ("RWA"), a joint exercise of powers authority formed under California Government Code section 6500 formed to serve and represent regional water supply interests and to assist its members in protecting and enhancing the reliability, availability, affordability and quality of water resources. The RWA has created the

Regional Water Efficiency Program to assist water suppliers to meet the Best Management Practices for Urban Water Conservation. To this end the Regional Water Efficiency Program Activities includes projects to improve landscape irrigation efficiency.

The joint powers agreement (“RWA JPA”) pursuant to which RWA was formed and operates, authorizes RWA to enter into a “Project or Program Agreement,” which is defined in the RWA JPA as an agreement between RWA and two or more of its Members or Contracting Entities to provide for carrying out a project or program that is within the authorized purposes of RWA, and sharing in the cost and benefits by the parties to the Project or Program Agreement.

Article 21 of the RWA JPA states: “The Regional Authority’s projects are intended to facilitate and coordinate the development, design, construction, rehabilitation, acquisition or financing of water-related facilities (including sharing in the cost of federal, State or local projects) on behalf of Members and/or Contracting Entities. The Regional Authority may undertake the development, design, construction, rehabilitation, acquisition or funding of all or any portion of such projects on behalf of Members and/or Contracting Entities in the manner and to the extent authorized by such Members and/or Contracting Entities as provided in this Agreement, but shall not accomplish these functions, nor acquire or own water-related facilities in its own name.”

3. RWA knows of no requirement that an election be conducted before entering into a funding contract with the State with respect to the proposed project.
4. RWA knows of no requirement that other government agencies review and/or approve a funding agreement between RWA and the State for the proposed project.
5. There is no impending litigation that may impact the financial condition of RWA, or its ability to complete the project. RWA has no water facilities.

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#### **A-11 OPERATIONS AND MAINTENANCE**

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Not applicable. Responsibility and liability is transferred to site owners. A commitment statement with signature will be on the application form and confirmed prior to agency funding commitment approval.

## PART B—ENGINEERING AND HYDROLOGIC FEASIBILITY

### B-1 CERTIFICATION STATEMENT

I, Lisa Maddaus, a California registered civil engineer, have reviewed the information presented in support of this application. Based on this information, and any other knowledge I have regarding the proposed project, I find that it can be preliminarily designed to accomplish the purpose for which it is planned. The information I have reviewed to document this statement included:

- Available information on large landscape sites within the respective RWA water supplier service areas.
- Equipment specifications from vendor catalogs and discussions with sales representatives.
- Avoided cost and other data as provided by RWA (Appendix D).
- Statement of Work, Schedule
- Budget Projections
- Economic Analysis



### B-2 PROJECT REPORTS AND PREVIOUS STUDIES

An example copy of a landscape audit already performed is provided in Appendix A.

The average annual water savings of 2.69 AF per acre of irrigated area is estimated for all 10 landscape audits performed to date as presented below in Section F-1. These audits are representative of the types of audits that will be performed to develop water budgets for the sites that qualify for this landscape incentive program.

The general protocol, or scope of work, for conducting the site audit includes:

- Work cooperatively with participating water supplier to provide landscape irrigation efficiency surveys and water budgets to targeted sites.
- Obtain water use data from water suppliers for the prior two years and quantify the amount allocated to landscape.
- Contact targeted customers to make appointments for surveys. Provide and have customer sign a “hold harmless” agreement protecting RWA and its members.
- Determine the irrigated area for each site and state the result in the reports.
- Survey irrigation system function.
- Provide Customer On-Site Report/checklist.
- Conduct irrigation tests using CAL POLY Irrigation Research and Training Center approved and/ DWR techniques.
- Determine irrigation efficiency.



- Identify needed irrigation system repairs and changes.
- Recommend irrigation schedules.
- Recommend water efficiency measures.
- Prepare report for customer describing the results and recommendations of the survey with copies to RWA and customer's water supplier.

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### **B-3 PRELIMINARY PROJECT PLANS AND SPECIFICATIONS**

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Preliminary plans and specifications are not required under this project as proposed. Site owners, as part of the application process, will be required to submit design plans for the irrigation system equipment to be installed, and associated cost estimate. Agency personnel will review applications and irrigation system design plans prior to approving each application.

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### **B-4 CONSTRUCTION INSPECTION PLAN**

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A verification of baseline metered water use will be confirmed by the landscape auditor for each site prior to Agency approval of the incentive to the customer. Once approved, the site owner will perform the construction. Then Agency personnel, or designated representative such as RWA, will verify that equipment installations have occurred through on-site inspections for each of the approved sites. After a favorable inspection report, and receipt of documentation from customer's installation costs, the Agency will initiate the first 50% of the reimbursement payments. , The second 50% installment payment may be approved following the review of water use data for 6 irrigation season months post installation to verify water savings.

## **PART C—PLAN FOR COMPLETION OF ENVIRONMENTAL DOCUMENTATION AND PERMITTING REQUIREMENTS**

### **C-1 CALIFORNIA ENVIRONMENTAL QUALITY ACT AND NATIONAL ENVIRONMENTAL POLICY ACT**

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CEQA/NEPA documentation is not applicable for this project, notice of exemption will be completed prior to contract execution between DWR and RWA.

### **C-2 PERMITS, EASEMENTS, LICENSES, ACQUISITIONS, AND CERTIFICATIONS**

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Not applicable.

### **C-3 LOCAL LAND USE PLANS**

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Not applicable. No proposed land use changes.

### **C-4 APPLICABLE LEGAL REQUIREMENTS**

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Not applicable.

## PART D- NEED FOR PROJECT AND COMMUNITY INVOLVEMENT

### D-1 NEED FOR THE PROJECT

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The efficient use of California's limited water supplies is a critical local, regional, and statewide water issue.

*Water Supply Reliability* - RWA is a joint powers agency of 18 water suppliers serving more than 1.2 million people in the greater Sacramento Region. The mission is to serve and represent regional water supply interests and assist RWA members with protecting and enhancing the reliability, availability, affordability and quality of water resources. The water supply for the retail agencies participating in this project comes partially or wholly from the Sacramento River and/or American River in addition to local groundwater supplies. The purpose of this project is to significantly increase water use efficiency by reducing the amount of peak summer demand that is particularly critical in dry-years. This project will provide benefit to the Bay-Delta by ensuring that water diverted upstream is used efficiently. An important objective of the Water Forum Agreement is for signatory water suppliers to reduce diversions from the Lower American River during critical dry years, so that flows may be maintained for aquatic life.

*Water Quality* - This project will positively impact the Bay-Delta systems by increasing instream flows and reducing the overall reliance on the surface water supplies from the American and Sacramento Rivers upstream from the Bay-Delta. The RWA's and its member agencies' conservation efforts are an important part of a long-term, comprehensive effort to reduce pressure on the Bay-Delta system to meet regional and state-wide water needs. One of the fundamental objectives of the CALFED Bay-Delta program is to reduce the mismatch between Bay-Delta water supplies and the current and projected beneficial uses dependent on the Bay-Delta system. Water use efficiency projects are one of the cornerstone strategies the CALFED Bay-Delta program is deploying to achieve this objective. Actual incentives for the purchase of efficient irrigation system equipment will reduce the demand for a significant urban end-use of Bay-Delta water supplies. It is anticipated that the 300 irrigation system equipment purchase incentives issued under this project will result in water savings of approximately 785 acre-feet per year and a total of 46,331 acre-feet by 2025.

By reducing the amount of water use by customers in the agencies' water supply areas, other beneficial uses will be realized during the critical summer months, such as providing flow to improve aquatic ecosystems and the habitat of many Federally listed species including: Delta Smelt, Splittail, Steelhead, Chinook salmon, fresh water shrimp, Coho salmon, and Steelhead along the American River and Lower Sacramento River watersheds.

*Water Use Efficiency* - A major component of RWA, the Regional Water Efficiency Program is designed to expand measures to help area water providers fulfill Water Forum best management practices (BMPs). The Regional Water Efficiency Program offers two tiers of services: Core activities serve as the fundamental building blocks necessary for implementing the BMPs and includes public information, school education, program marketing coordination, grant applications and technical assistance.

In addition, agencies can choose from subscription activities according to organizational and customer needs. These can include landscape irrigation surveys, marketing partnerships with landscape retailers, training for staff and customers, pilot projects, leak detection surveys and report preparation.

RWA and its member agencies are stakeholders in three major water management teams: Sacramento Area Water Forum (Water Forum), the American River Basin Cooperating Agencies (ARBCA), and the Sacramento Groundwater Authority (SGA). The project is consistent with the local water management plans including the SGA. This project is consistent with regional water management plans such as the ARBCA Regional Water Master Plan (RWMP) and Water Forum Agreement. This project is also consistent with statewide water management plans such as the California Urban Water Conservation Council's Memorandum of Understanding regarding Urban Water Conservation in California.

This project is compatible with each of this project's cooperating agencies' 2000 UWMP and RWA's ongoing efforts to achieve greater water use efficiency. RWA's Board of Directors recognizes the importance of water management and conservation programs. RWA's has the general policy that states in part that RWA will support its member agencies in operating and maintaining each individual purveyor's water system in an efficient and economical manner and distribute and supply water as fairly and equitably as possible.

All except one of the retail agencies that are external cooperating agencies are members of the Sacramento Water Forum.

In the year 2000, the Water Forum finalized the *Water Forum Agreement* (Agreement) which contains seven major elements to meet its objectives. Water conservation is the fifth major element in the Agreement. The water conservation portion of the Agreement describes each water purveyor's commitments to implement BMPs. These BMPs were derived from the original MOU developed by the CUWCC, and then customized for the Water Forum conservation agreements prepared for the individual purveyors.

This project involves the implementation of urban water conservation best management practice (BMP) number 5, *Large Landscape Program*, as originally defined by the California Urban Water Conservation Council (CUWCC). The unpredictable water supply and ever increasing demand on California's complex water resources have resulted in a coordinated effort by the California Department of Water Resources (DWR), water utilities, environmental organizations, and other interested groups to develop a list of urban BMPs for conserving water. This consensus-building effort resulted in the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU), which formalizes an agreement to implement these BMPs and makes a cooperative effort to reduce the consumption of California's water resources.

One of the Water Forum Agreement BMPs, Large Landscape Audits and Incentives for Commercial, Industrial, Institutional (CII) and Irrigation Accounts, BMP 5, further defines the goals for large landscape audits beyond the definition within the CUWCC MOU. Thus, the project is not considered an accelerated project as defined by DWR, but rather an extension to assist with implementation by the customer to achieve water savings. This project does not include implementing work considered a part of the requirements under the Water Forum Agreement BMP



## 5, Large Landscape Audits and Incentives for Commercial, Industrial, Institutional (CII) and Irrigation Accounts.

RWA member agencies serve approximately 1.2 million customers. The RWA incentive program will be modeled after the East Bay Municipal Utility District's successful program. RWA serves a similar customer base of 1.3 million customers in a 325 square mile area and had an irrigation rebate program. In the 2000 program, EBMUD paid \$141,311 to forty-seven accounts to save 4,559 gallon per day or 16.2 acre-ft per acre per year. In FY 02 EBMUD paid \$85,000 to 63 accounts to achieve 66,000 gpd savings. The rebates were given for upgrades to irrigation systems, such as computerized central control systems, improved sprinkler head spacing, and installation of individually controlled "value-in-head" sprinklers. Customers included three (3) golf courses, numerous homeowner associations, and the Castro Valley Union School District. In the EMBUD program, half of the rebates are paid at the end of the project and the remaining half paid after 12 months of demonstrated water use efficiency based on a site-specific water budget or efficiency standard and comparing to actual use to the recommended budget amount. (EBMUD, Water Conservation Division, FY00 Annual Report, 2001 and EBMUD FY 02 Water Conservation Master Plan, 2002 ).

This project is cost effective relative to savings in production and operating costs as shown in Section F of this application. Even though this project proves to be locally cost effective, agencies need grants for seemingly cost effective projects. The substantiation that a project is cost effective is not enough to get project approval, since project managers and engineers must compete for available utility dollars. There is seldom enough money to serve all of the needs. Regulatory issues often take priority, such as: monitoring water quality for an ever-broadening list and lowering detectable levels of constituents of concern; meter installation commitments (in the Sacramento region); and keeping up with new building development. In the private sector, the competition might use return-on-investment analysis where paybacks of 1-2 years receive budget allocations, but paybacks of more than 5 years seldom are considered for funding. Water efficiency measures, while meaningful investments, often have much longer paybacks.

### **D-2 OUTREACH, COMMUNITY INVOLVEMENT, SUPPORT, OPPOSITION**

This project is consistent with the California Urban Water Conservation Council's Memorandum of Understanding regarding water conservation. It is also consistent with the Sacramento Water Forum Agreement and RWA goals and objectives. A letter of support from the Sacramento Water Forum is included in Appendix E.

During 2002, the Sacramento region and especially Placer County have been reported as the fastest growing areas in California. New development is region wide, extending from Elk Grove in the south, Folsom and El Dorado in the east, Natomas on the west and Roseville, Rocklin, and Lincoln to the north. This growth includes development of homes, commercial campuses, parks and schools – all of which have landscapes which will drive up summer water use.

*New Landscape Advisory Committee* - Beginning in 2003, the Regional Water Authority Water Efficiency Program intends to develop a Landscape Advisory Committee. The committee will be modeled after those of the East Bay Municipal Water District and the Santa Clara Valley Water District. Probable members will represent landscape contractors, landscape designers, home

owners associations, real estate developers, retailers of landscape plant products, nurseries, and land use permitting agencies. Their purpose will to promote cooperative approaches for better water efficiencies in landscape. The results of this collaboration will lend direction to future RWA landscape projects and their implementation. High on the list will be the implementation of landscape oriented grants projects.

*Direct Marketing* - Additional outreach efforts support a regional-wide benefit, and will focus on those customers with irrigation accounts that have received landscape surveys with recommends for irrigation system improvements. Example marketing brochures from SCVWD and EBMUD landscape programs outline the type of marketing information that RWA is looking to emulate in its own program are provided in Appendix F.

Initial contact will be made via telephone by the individual water agency staff (or if requested of RWA staff or contractor) to the targeted irrigation customers. RWA anticipates forming a landscape advisory committee consisting of representatives form homeowners associations, commercial property managers, landscape contractors, the Building Industry Association, irrigation equipment manufacturers, and if possible community groups. To the extent practical, the project will specifically target disadvantaged communities within Sacramento and Placer Counties. There are no tribal entities particularly impacted by this project.

*Community Events, Newsletters, and Web Sites* - Information on the results of this project will be disseminated through RWA's public outreach program. RWA is in the process of building a broad public information program and associated schools program, which assist its member agencies through providing materials, speakers, and outreach activities to the general public.

Outreach activities will also include water agency community newsletters publications sent to its customers and Web site development, public meetings, RWA participation at community events, multimedia campaigns, interagency partnerships, corporate environmental fairs, professional trade shows, water conservation workshops and seminars and a speakers bureau.

Summaries of the results and benefits of this project will be developed by RWA staff and made available to RWA agency membership and its member agency customers. Member agencies will advertise this program through additional means such as inserts will be included in billing mailer inserts for those customers with irrigation accounts, newsletters, and agency Web sites.

## **PART E—WATER USE EFFICIENCY IMPROVEMENTS AND OTHER BENEFITS**

### **E-1 WATER USE EFFICIENCY IMPROVEMENTS**

There are multiple expected beneficial outcomes of this project and physical changes that will improve water use efficiency as a result. The value of those outcomes and physical changes are both quantifiable and non-quantifiable. The quantifiable values of physical changes that will occur as a result of this project and the beneficiary of each benefit are listed in Table E-1. Project outcomes and benefits will be shared among the project's beneficiaries and will directly and indirectly contribute to CALFED goals.

The direct, quantifiable improvements in water use efficiency are the reductions in outdoor watering due irrigation system repair and/or replacement at 300 sites within the Sacramento Metropolitan area. The area is predominately within Sunset Climate Zones 14 and 9 with evaporation rates averaging over 57 inches per year. It is assumed that the irrigable area for these irrigation systems average 4.75 acres and have an average consumptive water use of 6.6 acre-ft/acre per 6-month summer period (April through October). Only improvements in applied water to appropriate ET levels are considered with no improvements in reductions in runoff accounted for in net water savings. This project will result in total annual average water savings of 785 ac-ft/year, or 46,331 ac-ft over a 20-year period.

**Table E-1. Quantifiable Physical Changes, Expected Benefits, and Beneficiaries**

Physical change	Expected benefit	Beneficiary
Reduce water use on landscape irrigation by updating irrigation systems to better match applied water to evapotranspiration needs.	785 ac-ft/year 46,331 acre-feet for 20 year project life	CALFED goal to increase instream flows water in American and Sacramento River located upstream of the Bay-Delta system. Use local water supplies more efficiently
Water agencies in this project will save money on avoided costs of a new water supply	\$160/acre-foot of water saved	Water agency/customer

### **E-2 OTHER PROJECT BENEFITS**

Non-quantifiable project outcomes and benefits are listed and described in Table E-2. It is indicated how each non-quantified outcome or benefit will be shared among the project beneficiaries. The non-quantified outcomes expected to directly or indirectly contribute to CALFED goals are also identified and delineated.

**Table E-2. Non-Quantifiable Benefits**

<b>Physical change</b>	<b>Expected benefit</b>	<b>Beneficiary</b>
Reduce consumptive water use during summer peak demand period for irrigation by watering according to efficient evapotranspiration rates with the upgraded equipment	Improved Bay-Delta ecosystem	CALFED goal
Less water pumped from wells and less water diverted from the Lower American River. In addition, more water may be available for hydropower generation at Folsom Dam and Natomas Dam.	Energy savings from reduced pumping and energy generation from hydropower production.	USBR, and local water supplier participants of RWA
Appropriate amounts of applied water improve condition of landscapes:	More attractive landscapes Improved condition and utility of sports fields	Customers, regional residents, and visitors

## PART F – ECONOMIC JUSTIFICATION: BENEFITS TO COSTS

This section includes a breakdown and justification of the project budget and cost sharing information. Also described and analyzed are the benefits and costs of this project. Tables within this Section F, particularly the summary of benefits and cost analysis in Table F-3 below, are provided in lieu of the DWR Benefit Cost Summary Tables provided in the grant application package.

### F-1 NET WATER SAVINGS

The annual net water savings for the program is on average 2,312 ac-ft annually for over 20 years useful project life. It is assumed that the irrigable area for these irrigation systems average 4.75 acres and have an average consumptive water use of **6.6 acre-ft/acre per 6-month summer period** (April through October). Only improvements in applied water to appropriate ET levels are considered with no improvements in reductions in runoff accounted for in net water savings. In other words, the savings shown in landscape audits presented in Table F-1 below, was on average 40% potential savings, where this project assumes only 25% reduction in consumptive use. This project will result in total annual average water savings of **785 ac-ft/year, or 46,331 ac-ft** over a 20-year period.

**Table F-1. Water Savings from Completed Water Budget Survey Results**

<b>Site Name</b>	<b>Gross Area (ac)</b>	<b>Net Irrig. Area (ac)</b>	<b>Historical Usage (CCF)</b>	<b>Annual Excess (CCF)</b>	<b>Annual Excess (AF)</b>	<b>Gross % Savings</b>
CHWD Madera Park	15.24	12.8	10,775	359	25	3.33%
CHWD Rusch Park	51.05	36.8	44,117	13,990	101	31.71%
FOWD Phoenix Park	29	27.4	46,169	23,469	106	50.83%
FOWD Plaza Park	2.5	1.8	3,507	1,828	8	52.12%
OVWC Almond Park	10.5	9	13,148	5,346	30	40.66%
OVWC OV Comm Park	13.8	7.7	11,255	5,636	26	50.08%
OVWC Pecan Park	10.1	5.4	7,565	3,105	17	41.04%
SJWD Beal's Point State Park	6	5	7,803	3,695	18	47.35%
SJWD Douglas Ranch Park	4.3	3.1	4,795	2,028	11	42.29%
SJWD Granite Bay State Park	4	2.7	3,970	1,708	9	43.02%
SJWD Treelake Park	7	6	8,959	3,984	21	44.47%
<b>Average Water Savings Potential</b>						<b>40.63%</b>

Additional background information for the project net water savings is provided following Section F with summary tables that breakdown the estimated benefits and costs. Tables within this Section F, particularly the summary of benefits and cost analysis in Table F-3 below, are provided in lieu of the DWR Benefit Cost Summary Tables provided in the grant application package. An economic uncertainty analysis that tests the sensitivity of the net water savings assumption is presented in Section F-3.1, and resulted in low sensitivity for this value, when holding all other values constant.



## F-2 PROJECT BUDGET AND BUDGET JUSTIFICATION

Table F-2 presents a detailed estimated budget that includes relevant line items for capital outlay project proposals and justification of each line item. This table also indicates the amount of cost sharing for each element.

**Table F-2. Detailed Budget – Capital Outlay Project Proposal (2002 Dollars)**

Item	Justification	Labor		Other direct costs, dollars	Total, dollars	RWA portion	Prop 13 portion
		Hours	Dollars				
Land Purchase /Easement	Not applicable					0	0
Planning/Design/Engineering	Not applicable					0	0
Materials/Installation	\$5000 per site rebate – cost includes irrigation materials and installation			1,500,000	1,500,000		1,500,000
Structures	Not applicable					0	0
Equipment Purchases/Rentals	Not applicable					0	0
Environmental Mitigation/Enhancement	Not applicable					0	0
Construction/Administration/Overhead	\$1500 per rebate for RWA administration and overhead.			450,000	450,000	195,000	255,000
Project/Legal/License Fees	Not applicable					0	0
Contingency	To ensure sufficient funding			195,000	195,000	0	195,000
Other	Not applicable					0	0
Project Total				2,145,000	2,145,000	195,000	1,950,000

### F.2.1 Cost Sharing

RWA's participating agencies are providing 10% cost sharing (\$195,000) and RWA is thus requesting 90 percent in funding \$1,950,000 from the Proposition 13 Urban Water Conservation Program. Given that this is a project solely funded by the participating agency contributions and no additional cost recovery mechanisms are available for RWA to cover the eleven (11) member agencies committed to this program, RWA requests a \$195,000 contingency to ensure that funding available over the 12-month periods for the rebate program are sufficient given the contractual arrangements required by RWA bylaws, a Joint Powers Authority. Grant funded projects are structured on a subscription bases by the participating agencies. RWA bylaws prohibit the encumbrance of no-participants (even though they may be RWA members) with liabilities of subscription activities. RWA will make every effort to maintain the budget within the requested \$1,950,000.

There are no additional funding commitments or cost sharing agreements for this project. The previously mentioned landscape irrigation audit program is a separate subscription activity, with separate funding that cannot be used in this project.

### F-3 ECONOMIC EFFICIENCY

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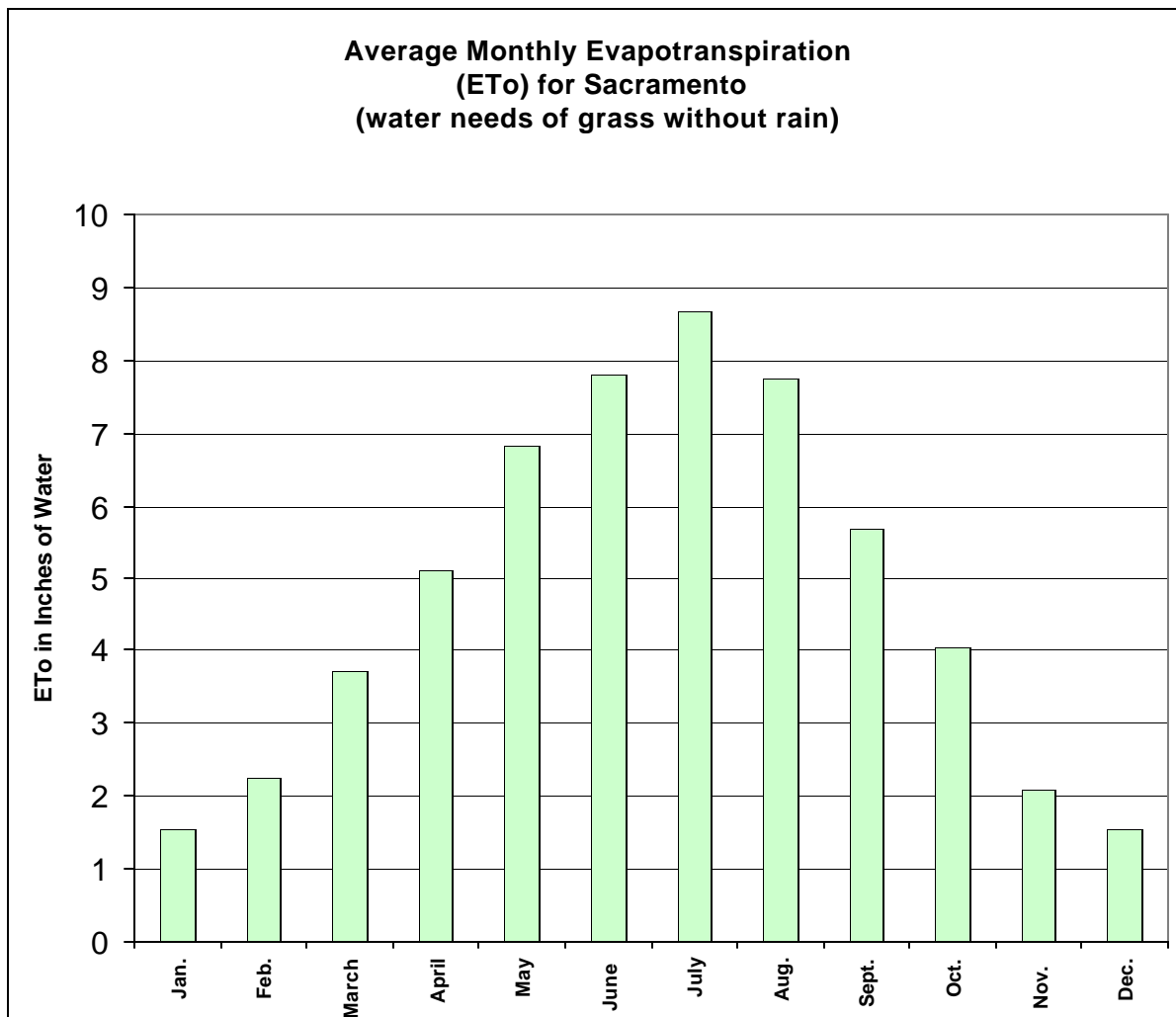
This section includes an assessment that summarizes the costs and benefits of the proposed project. The major analysis assumptions are listed and explained. This section also shows the present value of the quantified costs and benefits to the applicant, CALFED, and other parties affected by the project and summarizes non-quantified costs and benefits to the applicant, CALFED, and other parties affected by the project. In addition, a break-even analyses determining the sensitivity of the project's water savings assumptions to cost effectiveness is also provided.

This project is locally cost effective to the RWA. Based on the simplified benefit-cost ratio assessment in Table F-3, using project benefits and costs, **the project has a benefit to cost ratio of 2.3**. Since this number is greater than one, it indicates an economically justifiable project.

Below is a list and explanation of all the quantifiable benefits/costs assumptions and methodologies.

1. A total of three hundred large landscape accounts will receive financial incentives to purchase landscape irrigation equipment in this project. (100 rebates will be awarded in 2004, 100 rebates will be awarded in 2005, and 100 rebates will be awarded in 2006)
2. The maximum amount of rebate awarded per site is \$5,000 in phase 1, after Phase 1, review RWA reserves to revise the amount to \$10,000 per site.
3. The administration cost per site is \$1,500. This is the combined cost for RWA and its eleven participating agencies to administer the rebate per each large landscape site. The cost used in the analysis does not include the contingency.
4. The average total applied water use per site is estimated as 31.4 acre-feet during the peak irrigation season. The irrigation season is assumed to be a six-month period occurring from April through October. Based on irrigation account metered water use data for large landscapes in the Sacramento region that ranged between 115 to 155 percent of local reference evapotranspiration for the California Irrigation Management Information System (CIMIS) from the California Department of Water Resources, Climate Zone 14 (includes Sacramento area), it is estimated that the total average consumptive water use was 6.6 acre-feet per acre (79 inches) applied water for the 6-month irrigation season. Average ETo measured from the Fair Oaks CIMIS station is 45.88 inches for the April through October period. It is assumed that the irrigable area for these systems average 4.75 acres based on available site survey information (Figure 6).
5. Water savings from these rebates will result in 25% potential water savings. This water savings estimate is conservatively assumed based on water savings estimations in the *BMP Costs and Savings Study* (California Urban Water Conservation Council, 2000), Large Landscape Devices (particularly for central irrigation systems).
6. Given this project funding is targeting landscape design improvements (rather electronic control devices), the effective life of the rebate is 20 years. Water savings from rebates are

assumed to be 100 percent effective for the first 10 years from the administration of the rebate. Water savings are estimated to decrease 2 percent per year from the 10th to the 20th year, assuming routine operation and maintenance.



Source: Regional Water Authority from data by California Department of Water Resources, "California Irrigation Management Information System Reference Evapotranspiration, Station 131 Fair Oaks"

**Figure 6. Monthly ET<sub>o</sub> based on DWR CIMIS Data for Station 131, Fair Oaks**

7. All quantified benefits and costs are expressed in year 2002 dollars using a 6.00 percent discount rate as required.
8. The weighted value of conserved water for the water agencies under RWA used for this project is \$160/ac-ft. The justification for the weighted value of \$161/AF as the appropriate avoided cost of water supply is further described in Appendix G. In brief summary, this cost is based on the estimated surface water purchase costs and groundwater supply costs for the Sacramento Region presented in the *Economic Evaluation of Water Management Alternatives, Screening Analysis and Scenario Development*, for the CALFED Bay-Delta Program, October 1999.

An economic analysis of this project, based on the assumptions listed above is shown in Table F-3. Tables within this Section F, particularly the summary of benefits and cost analysis in Table F-3 below, are provided in lieu of the DWR Benefit Cost Summary Tables provided in the grant application package. A summary of the non-quantified costs and benefits to the applicant, each project beneficiary, and CALFED are summarized in Table F-4.

**Table F-3. Summary Economic Analysis**

List of Assumptions		
No.	Assumption	
(8)	Value of conserved water (\$/AF) =	160
(7)	Discount rate (real) =	6.00%
(4)	Average annual water use per site (acre-feet/year) =	31.4
(5)	Water savings =	25%
(2)	Cost of Rebate (\$) =	5000
(3)	Administration cost per rebate (\$) =	1500
(1)	Number of large landscape accounts awarded rebates in 2004 =	100
(1)	Number of large landscape accounts awarded rebates in 2005 =	100
(1)	Number of large landscape accounts awarded rebates in 2006 =	100

Calendar Year	Rebates Awarded	Incremental Water Savings (AF/yr)	Annual Water Savings (AF/yr)	Benefits (\$)					Costs (\$)				
				Avoided Capital Costs	Avoided Variable Costs	Avoided Purchase Costs	Total Undiscounted Benefits	Total Discounted Benefits	Capital Costs	Financial Incentives	Operating Expenses	Total Undiscounted Costs	Total Discounted Costs
Assumptions(1)	(4)	(8)	(8)	(7),(8)	(2)	(3)	(2).(3)	(2)(3)(7)					
2004	100	785	785	0	125,600	0	125,600	118,491	0	500,000	150,000	650,000	613,208
2005	100	785	1,570	0	251,200	0	251,200	223,567	0	500,000	150,000	650,000	578,498
2006	100	785	2,355	0	376,800	0	376,800	316,369	0	500,000	150,000	650,000	545,753
2007		0	2,355	0	376,800	0	376,800	298,461	0	0	0	0	0
2008		0	2,355	0	376,800	0	376,800	281,567	0	0	0	0	0
2009		0	2,355	0	376,800	0	376,800	265,629	0	0	0	0	0
2010		0	2,355	0	376,800	0	376,800	250,594	0	0	0	0	0
2011		0	2,355	0	376,800	0	376,800	236,409	0	0	0	0	0
2012		0	2,355	0	376,800	0	376,800	223,027	0	0	0	0	0
2013		0	2,355	0	376,800	0	376,800	210,403	0	0	0	0	0
2014		0	2,339	0	374,288	0	374,288	197,170	0	0	0	0	0
2015		0	2,308	0	369,264	0	369,264	183,513	0	0	0	0	0
2016		0	2,261	0	361,728	0	361,728	169,592	0	0	0	0	0
2017		0	2,214	0	354,192	0	354,192	156,659	0	0	0	0	0
2018		0	2,167	0	346,656	0	346,656	144,647	0	0	0	0	0
2019		0	2,120	0	339,120	0	339,120	133,493	0	0	0	0	0
2020		0	2,072	0	331,584	0	331,584	123,138	0	0	0	0	0
2021		0	2,025	0	324,048	0	324,048	113,528	0	0	0	0	0
2022		0	1,978	0	316,512	0	316,512	104,611	0	0	0	0	0
2023		0	1,931	0	308,976	0	308,976	96,340	0	0	0	0	0
2004		0	1,884	0	301,440	0	301,440	88,670	0	0	0	0	0
2025		0	1,837	0	293,904	0	293,904	81,560	0	0	0	0	0
Totals:	300	2,355	46,331	0	7,412,912	0	7,412,912	4,017,440	0	1,500,000	450,000	1,950,000	1,737,458

**Benefit cost ratio: 2.3**

Note:

(1) 100 percent water efficiency life of rebates is assumed to be 10 years at which time, water savings decrease by two percent per year for the following 10 years.

(2) Cost does not include contingency.

**Table F-4. Summary of Non-quantifiable Costs and Benefits**

	Non-quantified costs	Non-quantified benefits
RWA Agencies	None	<ul style="list-style-type: none"> <li>Increased water supply reliability</li> </ul>
CALFED	None	<ul style="list-style-type: none"> <li>Increased instream flows during summer peak irrigation season and dry-years</li> <li>Increased water supply reliability to water users while at the same time assuring the availability of sufficient water to meet fishery protection and restoration recovery needs</li> <li>More water for Bay-Delta water quality improvements and aquatic ecosystems</li> </ul>
Energy provider	None	<ul style="list-style-type: none"> <li>Energy savings as a result of less water pumped into the system.</li> </ul>
Groundwater Basin	None	<ul style="list-style-type: none"> <li>Decreased overdraft and improved water quality</li> <li>Increased flexibility in dry-year water supply options</li> </ul>
American River Ecosystem	None	<ul style="list-style-type: none"> <li>Improved aquatic and terrestrial habitat in the American River watershed</li> <li>More water available to meet fishery protection and restoration recovery near-term needs</li> </ul>

### Section F-3.1. Analysis of Uncertainty

This section addresses the uncertainty analyses performed for this project. The sensitivities of the cost effective analysis included modifications to the following assumptions:

- avoided cost of water supply;
- average annual water use per site;
- percent water savings;
- cost of incentive; and
- administrative cost.

Because the assumptions for average annual water use per site and the percent of that use for savings constitute a potential source of uncertainty in cost-effectiveness analysis, a sensitivity analysis was conducted to test results over a range of values, with other values held constant. While the average annual water use per site acted as a variable, the percent potential savings was held constant at 25%. Likewise, while the percent potential savings acted as a variable, the average annual water use per site was held constant at 31.4 ac-ft/yr. As shown in Table F-5, the analysis is considered not sensitive changes in the three primary values of avoided cost of supply, annual water use per site or percent potential water savings. The economic analysis spreadsheet for each of these analyses is provided in Appendix G of this application.



**Table F-5. Results of Economic Analysis**

Variable <sup>a</sup>	High/Low		Assumed		Break-even value <sup>b</sup>	
	Value	B/C ratio	Value	B/C ratio	Value	B/C ratio
Avoided cost of water supply (\$/af)	200	2.89	160	2.3	69	1.0
Average annual water use per site (ac-ft/yr)	50.0	3.68	31.4	2.3	13.6	1.0
Percent potential water savings	50%	4.62	25%	2.3	10.8%	1.0
Cost of rebate (\$)	2,500	3.76	5,000	2.3	13,500	1.0
Administrative Cost (\$)	1,125	2.45	1,500	2.3	10,000	1.0

<sup>a</sup> All other assumptions except for variable remain constant.

<sup>b</sup> Break-even value is that variable value which causes the benefit to cost ratio to equal 1.0.

## **APPENDIX A**

### **SUMMARY LIST OF LARGE LANDSCAPE SITES & EXAMPLE COMPLETED REPORT OF LANDSCAPE AUDIT**

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## **APPENDIX B**

### **PROJECT MANAGERS RESUMES**

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## APPENDIX C

### EXTERNAL COOPERATOR COMMITMENT LETTERS

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## **APPENDIX D**

### **BACKGROUND INFORMATION FOR ASSUMPTIONS**

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- **Avoided Cost of Water Source Documentation**



## **APPENDIX E**

### **LETTER OF SUPPORT – SACRAMENTO WATER FORUM**

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## **APPENDIX F**

### **EXAMPLE OUTREACH MATERIALS**

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- Example Marketing Brochure from Santa Clara Valley Water District ITAP Program
- Example Marketing Brochure from East Bay Municipal Utility District Landscape Conservation Program

## **APPENDIX G**

### **RESULTS OF ECONOMIC UNCERTAINTY ANALYSIS**

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